

**WATER QUALITY AND FISH HABITAT MITIGATION PLAN**

**NORTH SHORE RECREATION AREA  
SAND POINT MAGNUSON PARK**

**November 2001**

## Table of Contents

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<a href="#">1</a>	<a href="#">PROJECT DESCRIPTION</a>	1
<a href="#">1.1</a>	<a href="#">Project Background and History</a>	1
<a href="#">1.2</a>	<a href="#">Mitigation Plan Objective</a>	2
<a href="#">1.3</a>	<a href="#">North Shore Recreation Area Project Description</a>	3
<a href="#">1.3.1</a>	<a href="#">Non-Motorized Boating Center</a>	4
<a href="#">1.3.2</a>	<a href="#">Picnic Area</a>	7
<a href="#">1.3.3</a>	<a href="#">Habitat Restoration Area</a>	8
<a href="#">1.3.4</a>	<a href="#">Multi-Use Area</a>	8
<a href="#">1.4</a>	<a href="#">Construction Methods</a>	9
<a href="#">1.4.1</a>	<a href="#">Construction Schedule</a>	10
<a href="#">2</a>	<a href="#">POTENTIAL IMPACTS &amp; MITIGATION</a>	11
<a href="#">2.1</a>	<a href="#">Water Quality</a>	11
<a href="#">2.1.1</a>	<a href="#">Potential Construction-Related Impacts</a>	11
<a href="#">2.1.2</a>	<a href="#">Potential Impacts During Operation</a>	12
<a href="#">2.1.3</a>	<a href="#">Mitigation</a>	12
<a href="#">2.2</a>	<a href="#">Fish Habitat</a>	14
<a href="#">2.2.1</a>	<a href="#">Potential Construction-Related Impacts</a>	15
<a href="#">2.2.2</a>	<a href="#">Potential Impacts During Operation</a>	15
<a href="#">2.2.3</a>	<a href="#">Proposed Mitigation</a>	15
<a href="#">2.3</a>	<a href="#">Conclusion</a>	18
<a href="#">3</a>	<a href="#">CONSERVATION MEASURES USED DURING CONSTRUCTION</a>	20
<a href="#">4</a>	<a href="#">REFERENCES</a>	21

### List of Figures

- Figure 1. Vicinity Map
- Figure 2. Aerial Photo of Existing Conditions
- Figure 3A. Photographs of Existing Conditions
- Figure 3B. Photographs of Existing Conditions
- Figure 3C. Photographs of Existing Conditions
- Figure 4. Proposed Site Plan
- Figure 5. Cross Sections: Non-Motorized Boating Center
- Figure 6. Cross Sections: Habitat Restoration Area
- Figure 7. Conceptual Illustration, Non-Motorized Boating Center
- Figure 8. Conceptual Illustration, Habitat Restoration Area
- Figure 9. Changes in Impervious Area

## 1 PROJECT DESCRIPTION

### 1.1 Project Background and History

Sand Point Magnuson Park is a 320-acre park within the City of Seattle park system and is located on the western shore of Lake Washington (Figure 1). This park was recently expanded to include a 100+-acre parcel that was transferred to the City of Seattle by the US Navy following the closure of the Naval Station Puget Sound, Sand Point in 1995.

At the north tip of Sand Point Magnuson Park, the 18-acre North Shore Recreation Area (NSRA) is being converted to public recreational use. The site currently has extensive paved surfaces, sparse vegetation, and an armored shoreline (Figures 3A-3C). The project site is bordered by Lake Washington to the north, the National Oceanic and Atmospheric Association (NOAA) Western Administrative Support Center to the east, the NOAA Access Road to the south, and Sand Point Way NE to the west. The site is generally flat, with a few steep slope areas, such as the slope extending from Sand Point Way NE, just west of Building 11.

The NSRA site contains many features that supported the operation of a waterfront air station (Figure 2) such as:

- Several buildings, consisting of a former public works/shops facility (Building 11), a boathouse (Building 31), a large former aircraft hangar (Building 27), a former paint shop (Building 40), a former public works storage and pesticide control building (Building 115/206), a small storage building (Building 275), two pump stations (Buildings 98 and 116), and a floating boathouse (Building 402).
- Extensive paved areas (covering 78 percent of the site), bulkheads, and a seaplane ramp. (The large paved area between Buildings 11 and 27 was formerly used as an airfield tarmac; underground fuel lines in this area are still in place but no longer in use.)
- A pier, two floating docks and fixed boat moorage, a floating boathouse, and a log boom/wave break and dolphin.



In 1991, the US Base Realignment and Closure (BRAC) Commission recommended closure of Sand Point. Several environmental studies took place over the next several years in preparation for transferring the property, including soil testing, sediment testing and other environmental health and safety investigations:

- The extensive environmental review and cleanup at Sand Point was documented by the US Navy in the Base Realignment and Closure Cleanup Plan and Environmental Impact Statement for the Reuse of Naval Station Puget Sound, Sand Point.
- In October 1996, the City of Seattle issued a Final Environmental Impact Statement for the Sand Point Reuse Project that identified potential environmental effects of the proposed reuse of the Sand Point Property.
- In June 1997, the City Council approved the Sand Point Physical Development Management Plan (PDMP), which established that the NSRA would be used for non-motorized boating.
- On November 1, 1999, the Seattle City Council approved Resolution 30063, adopting the Sand Point Magnuson Park Concept Plan, which refined the design for the park including the NSRA.
- A Master Plan for the NSRA was developed in 2000-2001, consistent with the 1997 PDMP and the 1999 Concept Design.

The uses identified for the NSRA in the 1996 EIS are the same as those presented in this mitigation plan.

## **1.2 Mitigation Plan Objective**

Although the improvements proposed at the NSRA are expected to enhance the overall habitat conditions at the site, there are potential impacts to natural resources. By collectively assimilating these various potential impacts and the associated mitigation measures, the Mitigation Plan is designed to support environmental review and permitting requirements for the project, including:

- SEPA review by the City of Seattle Department of Parks and Recreation
- Shoreline Permit and Critical Areas Review by the City of Seattle Department of Construction and Land Use

- Environmental permits from the US Army Corps of Engineers (Section 404/10 permits), Washington Department of Fish and Wildlife (Hydraulic Project Approval) and Washington Department of Ecology (Water Quality Certification; Coastal Zone Management Act consistency determination).

Endangered Species Act (ESA) compliance is being coordinated through the Corps of Engineers, with the US Fish & Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS). Components of this Mitigation Plan have been incorporated into the Biological Assessments prepared for the project; these assessments are being used to fulfill the Corps' Section 7 consultation responsibility under ESA.

Specific components of this Mitigation Plan are:

- Description of the proposed improvements that have the potential to impact natural resources
- Ecological assessment of the potential impacts during construction and operation
- Description of mitigation strategy

### **1.3 North Shore Recreation Area Project Description**

The City of Seattle Parks Department is proposing to implement several improvements at the NSRA in order to develop a non-motorized boating center and picnic area. When complete, this boating center would be the only facility of its kind on Lake Washington, and one of only a few in the Pacific Northwest.

The existing facilities at the site would be improved in order to develop a non-motorized boating center that enhances public access to the waterfront, provides opportunities for storing and renting small sailing and paddling boats, and enhances teaching opportunities. These improvements would increase public access to Lake Washington. A site plan is provided as Figure 4 and shows four primary use areas for NSRA:

- Non-Motorized Boating Center
- Picnic Area

- Habitat Restoration Area
- Multi-Use Area

The following buildings would be removed as part of this project: Buildings 40, 115/206, 402, and a 1,250 square foot portion of Building 31. The existing picnic shelter would be relocated/reconstructed. More information on these changes is provided below.

### **1.3.1 Non-Motorized Boating Center**

The Non-Motorized Boating Center is the main focus of the NSRA, and would provide boating enthusiasts with a rare opportunity to access Lake Washington at a location dedicated to non-motorized uses. Boat storage and hand-launching facilities are designed to meet the specific needs of kayaks, canoes, sailboards, sailboats, outrigger canoes and similar watercraft. Specific improvements within the Boating Center are listed below.

**Lake Access.** Improvements to the waterfront area would allow for efficient launching of boats (all boat launches would be conducted by hand), and would benefit the educational offerings at the site. At the end of the main pier (Pier 1), a new 'fast launch' float would replace the existing float and would allow a group of rigged sailboats to be available for use at the same time. This would be advantageous for short duration after-school classes. Three floating docks and three boat ramps would also be constructed for boat launching.

**Table 1**  
**Proposed New In-Water Structures**

Facility	Dimensions (feet)	Total Square Feet
Fast Launch Float	18 x 95	1,700
Floating Dock W	8 x 185	1,500
Floating Dock M	8 x 152	1,200
Floating Dock E	8 x 157	1,250
Boat Ramp W	28 x 85	2,380
Boat Ramp M	38 x 51	1,940
Boat Ramp E	38 x 65	2,470



Amid the docks and covering the face of the existing bulkhead, a beach area would be created to serve the multitude of crafts that benefit from a beach-launch to the water rather than accessing the water via a dock or ramp. Figure 5 presents two cross-sections from the Site Plan within this portion of the waterfront. (As the face of the bulkhead would be covered, it would no longer function as a bulkhead.)

Several existing over-water structures would be removed from the site. These structures consist of a small pier, two floats, one dolphin, a floating boathouse, and a portion of Building 31. A 130-foot section of an existing log boom at the northwest edge of the site nearest to the shoreline would also be removed. A 170-foot portion of the log boom would remain (or be replaced) to provide some protection to the fast launch float and to the covered moorage (Building 31) directly south of the boom. Most of the in-water structures that will be removed are made of creosote-treated wood material.

A maximum of 15 buoys would be placed in the water to identify the deed restriction area at the east end of the site. A maximum of four additional buoys would be installed off shore for training and racing purposes.

Vehicular access to the waterfront would be provided via the existing paved areas along the east and west sides of Building 11, with turnarounds on both sides of the building. No other public vehicular access would be provided to the waterfront at the NSRA. Maintenance vehicles and emergency response vehicles would have access throughout the site.

***Safety Boat Moorage (Building 31).*** The single-story portion of Building 31, which is located over the water alongside Pier 1, would continue to house safety boats. The safety boats are the only motorized boats allowed to be housed at the facility and they are used to respond to an emergency on the water. (Some motorized boats may occasionally use moorage at Pier 1 for special events, but this use would be temporary only.) The two-story portion of Building 31 nearest the shoreline would be removed in order to enhance fish habitat along the



shoreline. Building 31 is immediately adjacent to the Habitat Restoration Area (see Section 1.3.3) and removing the 1,250 square foot portion of the building adjacent to the shoreline provides a critical element to meeting the fish habitat goals for the project.

***Boat Storage Area.*** A large portion of the former airfield tarmac would be fenced and used for upland boat storage. All of the non-motorized boats that would use the NSRA facility would be transferred to the water and launched by hand. The site plan locates the storage area close to the waterfront to minimize the distance individuals need to carry boats to the launch areas.

***Shoreline Access/Pedestrian Promenade.*** The project is designed to encourage public access to the waterfront. A pedestrian promenade would be established from the entrance of the NSRA to Lake Washington along Building 11, and continuing south along the stretch of waterfront adjacent to the new docks, and back toward the main park areas. Pedestrians would also be encouraged to access Pier 1 and watch the boating activities or just enjoy the scenery. Flagpoles with banners or other integrated art would also be installed at the Boating Center.

***Parking.*** The existing paved surface along the east and west sides of Building 11 would remain designated for vehicle parking. To the west of Building 11, three smaller buildings (Buildings 40, 115/206) would be removed to provide additional parking spaces. The existing paved area south of the proposed boat storage area would remain designated for parking. Some of the existing paved surface near the parking areas would be removed to allow for new landscaping. A small amount of new paving would be installed for vehicle parking and turnarounds. New pavement that is accessible to motor vehicles would be equipped with storm water treatment controls to treat runoff. The new storm water treatment facilities would be connected to the existing storm water conveyance system at the NSRA.





Figure 7 presents a conceptual illustration of the proposed improvements within the Non-Motorized Boating Center.

### **1.3.2 Picnic Area**

The northernmost portion of the NSRA would be designated for passive recreational uses such as picnicking. In keeping with a passive use environment, the Picnic Area would include grassy areas and revegetated areas, planted primarily with grass and native species of trees and shrubs. Specific improvements within the Picnic Area are:

**Revegetation.** As shown in photographs 7 and 8 in Figure 3B, the Picnic Area is generally void of any significant vegetation other than some grasses and weeds. The Parks Department is currently working to revegetate the area, and would continue this effort using the NSRA site plan as a guide. The site plan calls for some open areas to be planted with native trees and shrubs, enhancing the habitat value of the site as well as the enjoyment of the area by visitors. Other areas would be planted with grasses or other low vegetation to allow for picnicking. Some minor grading would occur in this area to help prepare the site for planting, but the design minimizes grading and takes advantage of the natural slope of the land. Revegetation efforts within the Picnic Area would be coordinated with guidelines established in the Vegetation Management Plan for Sand Point Magnuson Park (in progress) from the Seattle Department of Parks and Recreation.

**Sand Point Way NE Connection.** Additional shoreline access would be provided in the Picnic Area via a new pedestrian/bike trail connected to Sand Point Way NE. Some grading would be required to create a paved trail with a slope that adheres to American Disability Act (ADA) standards. A 4-foot-high fence would be installed on the east side of the path on the portion of the hillside west of Building 11 for public safety. The path would lead bicyclists and pedestrians from Sand Point Way NE through the Picnic Area toward the waterfront. As shown on the Site Plan in Figure 4, there would also be an opportunity for users

to connect to the southern portion of the NSRA and continue traveling on the pedestrian promenade in the Non-Motorized Boating Center area.

**Picnic Sites.** Individual and group picnicking opportunities would be available in open areas with views. The existing shelter structure, located approximately 75 feet from the shoreline would be removed and relocated or replaced with a new covered picnic shelter of a similar size.

### **1.3.3 Habitat Restoration Area**

One of the primary improvements within this part of the NSRA is the creation of a 0.23-acre Habitat Restoration Area, which would restore the fish habitat along a 640-foot section of Lake Washington shoreline. The existing armoring, including a concrete block bulkhead, would be removed. Excavation behind the existing armoring would create an expanded area of shoreline over existing conditions. Native emergent and scrub shrub vegetation would be designated for planting along the shoreline. Figure 6 presents two cross-sections from the Site Plan in the Habitat Restoration Area.

While no boat launch facilities are provided in the Habitat Restoration Area, a small beach area would be available for non-motorized boaters (e.g. sailors, canoers, kayakers) who wish to access a picnic site via the water. There is a small building (Building 275) near the beach area that would remain unchanged on the property, and may be used as a classroom, for storage, or for shelter. Figure 8 presents a conceptual illustration of the improvements in the Habitat Restoration Area.

### **1.3.4 Multi-Use Area**

At the eastern end of the NSRA, the proposed improvements are limited to new landscaping and establishing new pedestrian access through the area. The large parking area to the east of Building 27 would continue to be used for a variety of different recreational uses and special events.

***New Landscaping.*** As shown on the Site Plan (Figure 4) a portion of the existing paving at the eastern boundary of the Multi-Use Area would be removed and planted with trees and shrubs. On the north side of the Multi-Use Area some of the paving would be removed and replaced with lawn or reinforced turf. The plantings would enhance the aesthetics of the property and would also provide a natural screen between the NSRA and the adjacent NOAA facility. If possible, some of the excavated material from the Habitat Restoration Area (see above) would be used to create a berm for plantings between the two properties.

***Shoreline Access/Pedestrian Promenade.*** The pedestrian promenade in the Non-Motorized Boating Center would be connected to the Multi-Use Area, so that pedestrians can travel the entire stretch of lakefront in the NSRA.

#### **1.4 Construction Methods**

Construction materials and equipment would be transported to the site using either trucks or barges. It is anticipated that some of the demolition and construction of in-water structures would be conducted from a barge. The barge would be outfitted with equipment (e.g. crane, pile driver) capable of removing structures and placing new materials during construction activities.

Existing over-water structures to be removed from the site consist of a small pier, two floating docks, one dolphin, a portion of the log boom, a floating boathouse and a portion of Building 31. Decking from the pier and docks would be removed prior to extracting the supporting piles. Vibratory extraction would be used to pull 44 creosote-treated piles. If the floating boathouse is not relocated offsite, it will be dismantled during the NSRA construction activities.

Prior to removing the southern portion of Building 31, asbestos abatement procedures would be followed per the requirements of the deed restriction. A silt curtain would be placed around the demolition site to contain any materials that may fall during demolition, thereby avoiding debris falling into the water. The paint on Building 31 would be tested for lead content prior to disposing of debris material.

If necessary, some debris materials would be disposed of at a site suitable for hazardous waste disposal.

New over-water structures to be placed at the site consist of a fast launch float, three floating docks and three boat ramps. A total of 34 new piles would be installed to support the float and floating docks. No creosote-treated wood products would be used for in-water or over-water structures. The boat ramps would be constructed using pre-cast panels and floats. Gravel would be used to fill any gaps between panels. Some fill material (e.g., rock) would be required beneath Boat Ramp W to create the appropriate slope.

Washed gravel (1.5 inch minus) would be used to create the beach area in the Non-Motorized Boating Center. The gravel would be brought to the site and placed using trucks. A silt-curtain would be used during gravel placement to avoid any resulting turbidity.

The pedestrian promenade and all new pavement would be constructed using standard construction equipment. Standard bulldozing equipment would be used for grading activities to occur in the Picnic Area. Materials for revegetation, fencing, picnic sites and the picnic shelter would be brought to the site by truck. All removed pavement would be disposed of at an approved location.

Appropriate asbestos and lead-based paint testing, removal, and disposal procedures would be followed for removal of Buildings 40 and 115/206.

In new paved areas accessible to motor vehicles, new storm water catch basins equipped with treatment filters would be installed. These areas would be graded before paving, and any excavated soil from these areas would be tested and disposed of in accordance with the deed restrictions for the property.

#### **1.4.1 Construction Schedule**

The first phase of construction is scheduled to begin in Fall 2002. Work is expected to take 6-12 months to complete.

## 2 POTENTIAL IMPACTS & MITIGATION

Potential impacts to natural resources (related to water quality and fish habitat) would occur during construction and operation of the NSRA improvements. However, the project design and mitigation measures would minimize or avoid potential environmental impacts.

### 2.1 Water Quality

#### 2.1.1 Potential Construction-Related Impacts

**Erosion.** Some grading would be necessary in the Picnic Area in order to establish the pedestrian/bike trail. Establishing the turnarounds and parking area in the Non-Motorized Boating Center would require removal of existing impervious surface, followed by minor grading and resurfacing. Although no dredging would be required, upland excavation activities in the Habitat Restoration Area could also cause some potential for erosion. None of the grading activities at the NSRA are expected to cause significant, if any, amounts of erosion.

**Turbidity.** In-water construction associated with the removal of existing in-water structures and with the building of the improvements in the Non-Motorized Boating Center (floating docks, boat ramps, and beach) has the potential to increase turbidity in lake waters. The turbidity resulting from these activities would only occur during the hours of construction and would be restricted to the general work area. These temporary impacts would have minimal impacts to water quality.

**Hazardous Materials.** The large paved area between Buildings 11 and 27 was formerly used as an airfield tarmac with underground fuel lines. These lines have been removed, but soil boring data shows that some contaminants still reside in soils contained beneath the tarmac. Some asbestos and lead-paint abatement may be necessary in removing the southern section of Building 31 as well as Buildings 40 and 115/206. Finally, there is a potential for fuel spills from diesel-powered construction equipment.

### **2.1.2 Potential Impacts During Operation**

**Storm Water.** Storm water runoff at the site could affect water quality, however, no negative impacts related to storm water are anticipated. An existing storm water collection system is in place at the NSRA, consisting of several catch basins and underground pipes that convey storm water to one of four outfalls to Lake Washington. These outfalls at NSRA discharge storm water from other parts of Sand Point Magnuson Park and offsite residential areas, not just storm water from the NSRA site. As described in the mitigation discussion below (Section 2.1.3), the project would improve storm water quality over existing conditions by reducing storm water runoff volumes at the site.

**Hazardous Materials.** There is a potential for fuel spills during refueling of the emergency rescue boats operating at the NSRA. Other boat maintenance activities for both the motorized and non-motorized boats could also impact water quality.

### **2.1.3 Mitigation**

**Erosion.** To minimize or avoid potential impacts from erosion during grading activities, best management practices would be used. Native emergent and scrub shrub vegetation would be planted along the shoreline at the Habitat Restoration Area and grasses, native trees, and shrubs would be planted in the Picnic Area. The expanded shoreline that would be created in the Habitat Restoration Area is also anticipated to improve shoreline stability. The project would minimize grading and take advantage of the natural slope of the land in order to maintain slope and earth stability. For example, the proposed pedestrian/bike trail is designed to fit within the existing contours of the slopes in the Picnic Area as much as possible, while still meeting ADA standards.

**Turbidity.** A water quality certification from the Washington Department of Ecology would be issued for this project. The certification is granted only when the project construction methods, management practices, and monitoring plans achieve state water quality criteria. Construction documents for the in-water structures in the Non-Motorized Boating Center and the Habitat Restoration

Area would include measures to avoid or minimize turbidity, such as using vibratory extraction to remove old pilings. Washed rock would be used in constructing the new beach area, and a silt curtain would be used during the placement of the beach material to avoid potential turbidity impacts. These construction measures would be developed to comply with the Washington State water quality turbidity standard (WAC 173-201) for Class A waters.

No in-water construction would take place during the fish protection window(s), as established by the Washington Department of Fish & Wildlife (WDFW), NMFS and USFWS.

**Hazardous Materials.** The existing bulkhead south of Pier 1 would remain in place to avoid the potential for exposing contaminants to the environment. During installation of the new landscaping and storm water systems, any excavated soil from the tarmac area would be tested and disposed of in accordance with the deed restrictions for the property. No creosote-treated wood products would be used for new in-water or over-water structures to avoid potential leaching of contaminants to the aquatic environment.

Prior to removing the southern portion of Building 31, asbestos abatement procedures would be followed per the requirements of the deed restriction. A silt curtain would be placed around the demolition site to contain any materials that may fall during demolition, thereby avoiding debris falling into the water. The paint on Building 31 would be tested for lead content prior to disposing of debris material. Appropriate asbestos and lead-based paint testing, removal and disposal procedures would be followed for removal of Buildings 40 and 115/206. If necessary, some debris materials would be disposed of at a site suitable for hazardous waste disposal.

During construction, contractors would implement a spill prevention and response plan to avoid and minimize potential impacts to surface waters from fuel spills.

During operation of the site, the Seattle Parks and Recreation Department would implement similar procedures at NSRA that address boat maintenance and fueling processes in order to avoid and/or minimize potential impacts related to water quality.

**Storm Water.** During operation, implementing the site plan for the NSRA would improve storm water quality over existing conditions by reducing the total impervious surface area, reducing size of parking areas, and revegetating.

Implementing the proposed improvements at NSRA would reduce the amount of impervious surface area at the 18-acre site by approximately one acre, thereby reducing the volume of surface water runoff at the site. The reduction in impervious area would be accomplished by removing existing paving and replacing these areas with landscaping. The proposed changes to impervious surface area are shown in Figure 9.

Within the proposed Non-Motorized Boating Center, parking would be restricted to specific areas, as compared to the current situation where parking is allowed throughout the entire tarmac area. The designation of specific parking areas would reduce the amount of impervious surface with the potential to generate runoff that contains oil/grease deposits from automobiles. The majority of impervious surface in the Non-Motorized Boating Center would be designated for boat storage and the pedestrian/bicycle path.

Much of the Picnic Area would be revegetated, which would decrease the erosion potential and potential impacts to water quality at the site. This area of the park is currently covered with some weeds and/or dirt, and the new plantings would reduce the potential for runoff.

New pavement that is accessible to motor vehicles would be equipped with storm water filters to treat runoff. The new storm water treatment facilities would be connected to the existing storm water conveyance system at the NSRA.



## **2.2 Fish Habitat**

### **2.2.1 Potential Construction-Related Impacts**

No construction-related impacts are anticipated that would affect fish habitat other than the potential impacts to water quality described in Section 2.1.1.

### **2.2.2 Potential Impacts During Operation**

The NSRA site includes approximately 1,620 linear feet of Lake Washington shoreline, consisting largely of degraded aquatic habitat. As described in the mitigation section below (Section 2.2.3), the project design features several components that would improve the overall fish habitat at the NSRA over existing conditions. The increased recreational use of the site could cause minor disruptions in fish behavior, but this impact is not expected to be significant as all boats at the facility would be non-motorized (except emergency/rescue boats) and are not expected to create noise/vibration impacts.

### **2.2.3 Proposed Mitigation**

Several changes in the conditions at the NSRA would improve fish habitat, including: physical changes to the shoreline and substrate, reducing the area of over-water coverage, increasing the amount of aquatic habitat, reducing the number of wood pilings and other treated wood structures, and reducing storm water runoff.

***Physical Changes to the Shoreline and Substrate.*** Changing the physical condition of the shoreline at the NSRA would have a positive impact on fish habitat over existing conditions. Virtually all of the shoreline at the NSRA is currently armored with bulkheads, rocks, tires, construction debris, and anchored logs. Little riparian vegetation exists along the shoreline. Bulkheads severely alter shoreline function by preventing the recruitment of native sediment to the lake, reflecting wave energy, and permanently removing shoreline vegetation from the aquatic system (Kahler et al. 2000). A lack of native sediment input causes a loss of heterogeneous substrate, possibly affecting the availability of salmonid rearing habitat. Reflected wave energy in the littoral zone also leads to degraded salmonid habitat by creating energetically

unfavorable shallow water conditions. Furthermore, bulkheads are structurally simple relative to undisturbed shorelines that provide overhanging vegetation and complex wood debris. Juvenile chinook and coho salmon avoid bulkheaded areas due to the lack of aquatic vegetation and structural cover.

Implementing the proposed design for the NSRA would remove 640 feet of armored shoreline west of Pier 1 (including 240 lineal feet of bulkhead), and would create a 630-foot beach/gravel substrate habitat in front of the bulkhead south of Pier 1. In the Habitat Restoration Area, the existing asphalt road bordering the shoreline would be removed and new riparian vegetation would be established to improve over-water shading along the shoreline. The removal of the armored shoreline in the Habitat Restoration Area would allow dissipation of wave energy from the lake, and provide more opportunity for aquatic plants and benthos to establish—thus enhancing foraging habitat. Establishing the beach habitat in front of the bulkhead in the Non-Motorized Boating Center would have a similar effect, dissipating wave energy and providing an opportunity for enhancing foraging and resting habitat. Studies have shown that juvenile chinook and coho avoid large predators by hiding in shallow vegetated waters similar to the proposed Habitat Restoration Area (Kahler et al. 2000).

***Reduction in the Area of Over-Water Coverage.*** Over-water structures can have a negative impact on fish habitat. The shading effect from these structures changes water temperatures, which may limit food production as well as disorient migrating salmon. In addition, bass (a salmon predator) are known to hide under these structures, providing another risk (Kahler et al. 2000). Implementing the proposed improvements at the NSRA would result in a net reduction in over-water coverage of 175 square feet, thereby providing another beneficial impact to fish habitat. Some new over-water structures are proposed, with several existing structures slated for removal. The net reduction in the area of over-water coverage is calculated in Table 2.

**Table 2**  
**Area of Over-Water Coverage for New and Removed Structures**

Existing Structures to be Removed		Proposed New Structures	
Structure	Size (square feet)	Structure	Size (square feet)
Floating boathouse	1,550	Fast Launch Float (end of Pier 1)	1,700
Small float	1,100	Floating dock W	1,500
Building 31	1,260	Floating dock M	1,200
Large float	940	Floating dock E	1,250
Small pier	975		
<b>Total:</b>	<b>5,825</b>	<b>Total:</b>	<b>5,650</b>
<b>Net Reduction: 175 square feet</b>			

***Increases in Aquatic Habitat Area.*** The site plan for the NSRA calls for several features that would change the amount of aquatic habitat at the site. The new beach and boat ramps at the Non-Motorized Boating Center would reduce existing aquatic area, while the design of the Habitat Restoration Area would provide new aquatic area. Overall, there would be a net increase in the area of aquatic habitat by 0.05 acres as shown in Table 3.

**Table 3**  
**Aquatic Area Changes**

Feature	Conversion of Aquatic Habitat to Upland (acres)	Conversion of Upland to Aquatic Habitat (acres)
New upland beach at Boating Center	0.14	
Boat ramp W	0.02	
Boat ramp M	0.01	
Boat ramp E	0.01	
Habitat Restoration Area		0.23
<b>Totals:</b>	<b>0.18</b>	<b>0.23</b>

***Reduction of Wood Pilings and Other Treated-Wood Structures.*** Chemically treated wood products can leach small amounts of contaminants into the aquatic environment through the water columns and sediments. Most resource agencies

have encouraged property owners to eliminate creosote-treated products from their plans for waterfront construction.

The existing docks and piers at the NSRA are supported by creosote-treated wood pilings. Other existing treated-wood structures at the site consist of a floating log boom at the far north end of the site, and one dolphin.

Approximately 44 creosote treated wood pilings and the dolphin would be removed from the site, along with the removal of other structures identified in Table 2. A 130-foot section of the log boom would also be removed, with 170 feet remaining to provide some protection from wave action to facilities at the north end of the site. Approximately 34 new pilings would be installed to support new floats and docks at the NSRA. These pilings would not be made with creosote-treated wood products.

***Reduction in Storm Water Runoff.*** As described in Section 2.1.2, the site plan for the NSRA provides beneficial impacts related to storm water—reducing storm water runoff volumes at the site, and improving the quality of runoff from the site over existing conditions. The improvement to water quality would also contribute to improved fish habitat.

***Recreational Use.*** Increased recreational use of the area resulting from the shoreline improvements would not have a significant negative impact on habitat.

## **2.3 Conclusion**

Construction of the proposed improvements at the NSRA would result in a better habitat for fish. The improvements have been designed to ensure that fish habitat is enhanced and protected, and negative impacts are avoided or minimized. These mitigation measures are summarized as follows:

- Siting the Habitat Restoration Area adjacent to the Picnic Area maximizes the potential for providing high quality foraging and resting habitat for fish. The reforestation and revegetation in the Picnic Area enhances the habitat value of the shoreline restoration effort.

- Removing a 1,250 square foot portion on the south end of Building 31 would help connect the north and south shorelines at the site, providing an improved migratory corridor through the NSRA for juvenile salmonids.
- Constructing the Habitat Restoration Area would convert upland habitat to aquatic habitat by removing the existing bulkhead and pulling the shoreline back approximately as much as 35 feet along its length. This construction would restore fish access to the area and provide emergent aquatic and overhanging woody vegetation that is important for juvenile salmonid habitat.
- Providing revegetation of the shoreline in the Habitat Restoration Area would provide a source of food (terrestrial insects) for salmonids.
- Reducing the surface area of over-water structures at elevations most critical to juvenile salmon would reduce the amount of shading in the project area, thus reducing preferred bass habitat and decreasing salmonid mortality.
- Covering but retaining the existing bulkhead structure east of Pier 1 to prevent potential exposure of contaminants under the tarmac from entering the aquatic environment.
- Avoiding use of creosote-treated wood products for in-water and over-water structures.
- Using small gravel in the proposed new beach area (1.5 inch minus), would be consistent with a substrate preferred by juvenile chinook for rearing and migration (GLWTC 2001), as opposed to existing vertical bulkhead conditions.

### 3 CONSERVATION MEASURES USED DURING CONSTRUCTION

In order to minimize impacts from construction activities, best management practices (BMPs) would be implemented. The contractor would be required to comply with Washington State Surface Water Quality Standards (WAC 173-201-201A); Department of Ecology's Dangerous Waste Regulations (WAC 173-303); General Occupation Health Standards (WAC 276-62); and all regulatory permit conditions, including USACE Section 404 permit, Ecology 401 Water Quality Certification, and WDFW Hydraulic Project Approval. The contractor would work under performance specifications to limit temporary turbidity impacts at the project site as outlined in the application to Ecology to allow temporary exceedance of water quality standards.

The following BMP operational guidelines have been identified for the construction activities:

- Timing of construction activities to avoid juvenile salmonids.
- In-water work would be minimized.
- A construction barge would be maintained in necessary water depths to avoid grounding.
- A silt curtain would be used during demolition of the southern portion of Building 31, and during construction of the beach area.
- Washed rock would be used to construct the beach to minimize turbidity potential.
- All creosote treated wood that is removed would be disposed of in accordance with Washington State's Dangerous Waste Regulations (WAC 173-303) and Excluded Categories of Waste (WAC 173-303-071).
- All waste and debris generated by the project would be collected and removed to a legally permitted waste disposal or recycling site.

An emergency spill containment kit would be located onsite, and a pollution prevention plan detailing planned fueling, materials storage, equipment storage, and waste storage areas would be prepared to address prevention and cleanup of accidental spills.

## 4 REFERENCES

- Department of the Navy. 1997. Final Environmental Impact Statement Reuse of Naval Station Puget Sound, Sand Point, Seattle Washington.
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- Kahler, T., M. Grassley, and D. Beauchamp. 2000. A summary of the effects of bulkheads, piers, and other artificial structures and shorezone development on ESA-listed salmonids in lakes. Utilities Department, City of Bellevue, Washington.